DOCUMENT RESUME

ED 051 528 CG 006 460

AUTHOR	Davidson, Andrew R.; Steiner, Ivan D.
TITLE	Reinforcement Schedules and Attributed Freedom.
INSTITUTION	Illinois Univ., Champaign.; Massachusetts Univ., Amherst. Dept. of Psychology.
SPONS AGENCY	National Institutes of Health (DHEW), Bethesda, Md.
PUB DATE	May 71
NOTE	33p.; Paper presented at the Rocky Mountain Psychological Association Convention in Denver, Colorado, May 12-15, 1971
AVAILABLE FROM	Ivan D. Steiner, Department of Psychology, University of Massachusetts, Amherst, Massachusetts 01002
EDRS PRICE	EDRS Price MF-$0.65 HC-$3.29
DESCRIPTORS	Attitudes, Behavior, Behavioral Objectives, Behavior Change, *Communication (Thought Transfer), *Discrimination Learning, Motivation, *Operant Conditioning, *Perception, *Reinforcement, Rewards, *Teaching Techniques

ABSTRACT

This study tests the contention that a reinforcing agent's manner of administering rewards and punishments is construed by his associates as revealing his margin of freedom, and that associates are more attentive to cues concerning a reinforcing agent's dispositional qualities, and more inclined to ingratiate themselves to him, when he employes reinforcement techniques that imply a high degree of freedom. Eighty-eight naive subjects were reinforced for performance on an anagram task on either a 40% or a 100% reinforcement schedule. Those subjects receiving 40% reinforcement: (1) attributed greater freedom to the "teacher"; (2) were more attentive to cues concerning the teacher's dispositional qualities; and (3) manifested a greater tendency to ingratiate themselves to the teacher. Results suggest that reinforcements are communicative acts which inform the recipient of the probable intentions, attitudes and freedom of the agent who administers them. (Author/TL)

ED051528

[redacted]

Reinforcement Schedules and Attributed Freedom[1]

Andrew R. Davidson and Ivan D. Steiner[2]

University of Illinois

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

In a recent literature review Steiner (in press) examined a wide array of research and theory suggesting that the reactions an individual evokes from his associates depend in part upon the amount of freedom they attribute to him. Thus, for example, evidence indicates that associates are less likely to impute dispositional qualities to the individual when his observable behaviors are thought to be role directed than when they appear to be performed without external coercion or restraint. Under the former condition associates are also less inclined to be persuaded by the individual's advocacy of an attitudinal position, and less prone to form strongly positive or negative appraisals of him. Furthermore, associates are more likely to react in an ingratiating manner if the individual seems to enjoy a margin of freedom to decide whether or not he will administer the payoffs he controls. The present study continues the investigation of attributed freedom. It tests the contention that a reinforcing agent's manner of administering rewards and punishments is construed by his associates as revealing his margin of freedom, and that associates are more attentive to cues concerning a reinforcing agent's dispositional qualities, and more inclined to ingratiate themselves to him, when he employs reinforcement techniques that imply a high degree of freedom.

In previous studies researchers have induced the

CG 006 460

perception that an actor has little freedom by publicly assigning him to a role (Jones, Davis & Gergen, 1961; Steiner & Field, 1960), by telling subjects that the actor has been instructed to produce a message favoring a specified point of view (Jones & Harris, 1967), or by creating conditions under which it appears unlikely that the actor possesses the ability, knowledge or environmental support that is needed in order to change his behavior (Berkowitz, 1962; Burnstein & Worchel, 1960; Cohen, 1955; Lanzetta & Hannah, 1969; Pastore, 1952; Weiner & Kukla, 1970; Wiggins et al., 1965). In only a few studies of the third type has the actor's own behavior been manipulated to create the impression that he possesses a wide or narrow margin of freedom. The authors have discovered no instance in which the rewarding behaviors of a reinforcing agent have been systematically manipulated for this purpose.

If a person is known to lack freedom we are likely to expect him to behave in a rather standard and consistent manner. But if a person is known to behave in a highly consistent and predictable fashion, will we conclude that he therefore lacks freedom? If a reinforcing agent always rewards one type of response, and always punishes another, will he be seen as enjoying less freedom to determine his own reinforcement strategy than one who adheres to a schedule of variable reinforcement? Such may be the case for either of two reasons: (a) routine behavior tends to acquire an aura of normativeness (Waller & Hill, 1951; Thibaut & Kelley, 1959), or (b) behaviors that seem typical or appropriate tend to be

understood as consequences of situational constraints or social rules, and are not thought to be prompted by the actor's personal preferences (Jones & Davis, 1965).

Hypothesis 1. An individual whose reinforcing behaviors are highly consistent across trials (e.g., 100% reinforcement) will be seen as possessing less freedom to select his own reinforcing strategy than will an individual who employs a less consistent schedule (e.g., 40% reinforcement).

It has been reported (see Jones & Davis, 1965; Steiner, in press) that subjects are more confident of their evaluations of persons whose behaviors appear to be freely performed than of those who are thought to act under constraints. Consequently, if Hypothesis 1 is confirmed, a second hypothesis may be advanced.

Hypothesis 2. Subjects receiving inconsistent reinforcement will manifest greater confidence in their ratings of the agent's dispositional qualities than will subjects receiving consistent reinforcement.

When a reinforcing agent seems free to do as he pleases, people on whom he may bestow his rewards are well advised to discover what pleases him. Thus if Hypothesis 1 is supported we may anticipate that an inconsistent reinforcement schedule will prompt greater attentiveness to cues concerning the agent's beliefs and preferences than will a consistent reinforcement schedule.

Hypothesis 3. After exposure to cues concerning a reinforcing agent's dispositional qualities, subjects who have

received inconsistent reinforcement from the agent will report these cues more accurately than will subjects who have received consistent reinforcement.

According to Jones (1964), Jones et al. (1965), and Kauffman & Steiner (1968), subjects are unlikely to ingratiate themselves to a power figure who has little freedom to decide when or how his power will be employed. However, ingratiation is a common tactic for gaining payoffs from power agents who are thought to enjoy a margin of freedom concerning the use of their power. Assuming support for Hypothesis 1, we may predict the following relationship.

Hypothesis 4. Subjects exposed to inconsistent reinforcement will manifest a greater tendency to ingratiate themselves to the reinforcing agent than will those who receive consistent reinforcement.

The consistency with which a reinforcing agent administers rewards and punishments is not the only factor that may influence the amount of freedom he is presumed to enjoy. If the persons over whom the agent exercises his control hear or see a higher authority instruct the agent when to use his reinforcing capacities, they are unlikely to attribute much freedom to him. In this research both the reinforcement schedule of the agent and receipt vs. nonreceipt of instructions are manipulated. If the receipt of instructions affects perceived freedom in the same way as does consistent reinforcement, Hypotheses 2, 3, and 4 may be rephrased to express the impact of the former variable. Thus subjects who receive reinforcements

from an instructed reinforcing agent should (a) express little confidence in their evaluations of the dispositional characteristics of the agent, (b) be inattentive to cues concerning his dispositional qualities, and therefore inaccurate in recalling such cues, and (c) be uninclined to ingratiate themselves to him.

Method

Subjects and Design

Ninety male students enrolled in the elementary psychology course at the University of Illinois served as subjects in the experiment. They received course credit for their participation. Two subjects were eliminated from the analysis; one expressed suspicion concerning the true identity of the accomplice and one was unable to complete the required questionnaires and procedures within the one hour time allotment. A 2 x 2 factorial design was employed. Half the subjects received continuous reinforcement from an experimental accomplice, while the remainder received variable reinforcement. Within each of these two categories of subjects, half saw the accomplice receive instructions concerning the manner in which reinforcements should be administered and half did not. Twenty-two subjects were randomly assigned to each cell of the design.

Procedure

The subject and accomplice (a male student) waited in a corridor until the experimenter appeared and ushered them into the experimental room. They were seated at a table and asked

to respond to 8 items from the California F scale by placing checkmarks on 5-inch graphic scales. The end points of the scales were anchored by "agree very strongly" and "disagree very strongly". After this instrument was collected participants responded to the Rotter I-E scale (Rotter, 1966).

The experimenter then explained that the major purpose of the experiment was to examine the effects of a teacher's behavior on a student's performance. In particular, the experimenter claimed to be interested in identifying the kind of instructional behaviors that improve a student's performance. It was announced that one subject would be randomly assigned the role of teacher and one subject that of a student. The "random" selection process was a rigged lottery through which the accomplice was always assigned the role of teacher.

Participants were then moved to a table on the opposite side of the room. On this table were two piles of 25, 3 x 5 cards labeled "anagram task 1" and "anagram task 2", and a metal box. The experimenter informed participants that during the course of the experiment they would complete the two anagram tasks and that an intermission would be interspersed between the two tasks. The second anagram task was an experimental ploy and was never actually utilized.

The metal box was placed near the teacher, and the first deck of anagrams was placed behind it, blocking the student's view of the anagrams. After a brief explanatory introduction to the anagram task, the teacher was instructed to present the anagrams one at a time to the student. The experimenter

demonstrated with the first four cards.

The student was instructed to solve the anagrams as quickly as possible and to state his answer aloud. It was made clear that the formation of any English word using each letter once, within the 20-second time limit, would be considered a correct response. The experimenter asserted that he would time the student on each anagram and would state after each response whether it was correct or incorrect. Five of the 25 anagrams were insolvable. The other 20 had been selected after numerous pretests had indicated that they were easy enough to be readily solved by college students.

The experimenter opened the metal box which was so located that its contents could not be seen by the subject, and said:

> "Teacher, another of your duties is to dispense reinforcements to the student in the form of coins from this box. Student, any money you have left over at the end of this task is yours to keep and, similarly, any money you have at the end of the second anagram task will also be yours to keep. Teacher, you will also make some money; however, you are being paid a set amount for participation in the study. Your money has already been set aside for you."

Receipt of reinforcement rules. In half of the sessions the teacher (accomplice) was told to reinforce the student according to a schedule provided by the experimenter. He was given a card ostensibly containing reinforcement rules and told, "I want you to follow these instructions explicitly in your rewarding and punishing of the student with this money. Keep the instructions with you and refer to them at any time you need to." (During the anagram task the accomplice frequently referred to the instructions.) Although subjects saw

the teacher receive the card of instructions they had no way of knowing how specific or detailed the rules were.

Nonreceipt of reinforcement rules. In half of the sessions the teacher was not given a card bearing instructions but was told, "You are to use this money in any way you think will be most effective in improving the student's performance. During the course of the anagram task you can give the student money at any time or take money back at any time. I leave it completely to your own discretion to create your own schedule of reward and punishment."

Continuous reinforcement. In half of the sessions the teacher reinforced the student according to a continuous (CRF) schedule, rewarding the student with a dime for each anagram correctly solved and punishing him for each incorrect solution by taking away a dime. Eighty percent (20) of the reinforcements were positive and twenty percent (5) of the reinforcements were negative, leaving the student with the total earnings of $1.50.

Variable reinforcement. In half of the sessions the teacher reinforced the student on a predetermined variable ratio (VR: 2.5) schedule, rewarding the student with a quarter eight times and twice punishing the student by taking a quarter away.[3] Therefore, although the reinforcement schedule and magnitude of reinforcement varied between conditions, within each condition 80% of the reinforcements were positive and 20% were negative, and all subjects earned $1.50.[4]

Upon completing the anagram task the subject was assured

once again that he could keep his earnings and was encouraged to put the money in his pocket. The experimenter then administered the Effectence Arousal (EA) scale (Byrne & Clore, 1967) to both participants, under the guise of examining their reactions to the first anagram task. Following the EA scale the accomplice was informed that since he was serving as teacher in the experiment, the experimenter would like to learn about his "personality" and "some of his ideas concerning teaching." The student was handed a Life magazine and told that he could relax during this brief intermission and look at the magazine if he wished. However, the experimenter reminded the subject that he would soon be working on the second "money-making anagram task" which would be identical in form to the first task.

The teacher was ushered to a table at the opposite side of the room and seated alongside the experimenter with his back to the student. The student, however, was close enough to hear the ensuing conversation and was thus free to ignore the magazine and eavesdrop if he chose to do so. The interview, which was conducted in subdued tones, began with an "association test". The experimenter orally presented a series of stimulus words, and the accomplice responded with a prearranged response to each stimulus. Half of the items resembled those of a typical "association" test (e.g., love-girl) while the others dealt with the student-teacher situation (e.g., error-mistake). All of the prearranged responses seemed to the authors to be consistent with the stimuli with which they were paired.

At the completion of these items the experimenter stated that he would like to obtain information concerning the teacher's teaching philosophy. To accomplish this end the experimenter asked the teacher six short questions concerning his teaching philosophy (e.g., What is the most effective way of improving learning: reward or punishment?). To each question the accomplice responded with a predetermined one- or two-sentence answer. These questions and the accomplice's answers have been reported elsewhere by Davidson (1970), as has the list of stimulus and response words mentioned above.

Following the interview the student's magazine was collected and participants were informed that the experimenter was also interested in learning finding out whether teacher-student pairs who know one another perform better on an intellectual task than teacher-student pairs who do not. Participants were told that they would have a chance to become acquainted through the use of a highly controlled conversation technique (Kauffmann & Steiner, 1968).

> If we just allow two people to talk together for a few minutes some groups of people would talk about one thing and other groups would talk about something entirely different. To ensure that all our groups talk about the same thing, I will give you a questionnaire on which you are to indicate a few of your beliefs or attitudes. You are each receiving different questionnaires, but after you have filled them out you will exchange papers to enable you to see how the other person feels about the issues. Then you will each answer the same questions the other answered and we will exchange papers again. This way you will learn something of the other person's attitudes just as you might in a normal conversation.

The accomplice received a questionnaire containing the

8 F-scale items that both participants had completed at the outset of the experimental session, whereas the subject received a form containing 8 different items from the F scale. The accomplice responded to his scale by checking spaces that had already been lightly marked by the experimenter.[5] When the student and teacher exchanged papers the student learned that the teacher held views that were systematically different from his own. Because the student had been instructed to place checkmarks on the teacher's paper in order to indicate how he personally felt about each of the items, and because he realized the teacher would see the answers he supplied, an opportunity was created for the student to ingratiate himself to the teacher through the use of conformity.

Following completion of the "controlled conversation" the experimenter said that he wanted the teacher to fill out a questionnaire that was different from the one the student would be receiving and involved very different instructions. Consequently, the experimenter informed the teacher that he would prefer to have him complete this questionnaire in another room. He then ushered the teacher into an adjacent room, returning immediately to the experimental room. The subject was presented with an instrument asking him to recall the teacher's responses to both the questions concerning teaching philosophy and to the association test. There were also items concerning the subject's perception of the teacher.

Upon completion of this questionnaire the student was told that there did not seem to be enough time available for the

second anagram task. He was allowed to keep his earnings and was informed that he had done well on the anagram task. A letter was sent to each subject at the completion of the research, describing the experiment and its results, and explaining the necessity for the deception.

Results

Perception of Freedom

Perception of the other's freedom was measured on two 9-point scales: "How free did the teacher feel to withhold reward when you gave a correct answer to an anagram?" and "How free did the teacher feel to withhold punishment when you made a mistake on an anagram?". The end points of both scales were anchored by (1) "not at all free" and (9) "very free". Because the responses to these items were highly correlated ($r=.79$ across cells; within cells the lowest correlation was $r=.52$), the scores were summed to yield a single measure of perceived freedom.

Table 1 summarizes the results of a 2 x 2 analysis of variance performed on the perceived freedom scores. There was a significant main effect of reinforcement schedule ($p < .001$) indicating that the mean perceived freedom score was significantly higher for the variable ratio conditions (12.45) than for the continuous conditions (4.98). Neither the interaction effect nor the main effect of instructions was significant.

Insert Table 1 about here

A Newman-Keuls test performed on the cell means indicated that: (a) VR, no-instructions was significantly larger than CRF, no-instructions ($p < .01$), and (b) VR, instructions was significantly larger than CRF, instructions ($p < .01$). The reinforcement schedule manipulation accounted for 48% of the variance in the perceived freedom ratings. Thus there is support for the first hypothesis which predicted that an agent whose reinforcing behaviors are highly consistent will be seen as possessing less freedom than an agent who employs a variable schedule of reinforcement.

The impact of reinforcement schedule is also revealed by subjects' responses to a request that they "describe the teacher as he really is." Table 2 reports the anchor points and values of the ratings subjects gave on four nine-step scales. A separate analysis of variance was performed for each item and revealed a significant main effect for reinforcement schedules ($p < .01$) and a significant instructions x reinforcement interaction ($p < .01$) for each. It is clear that subjects who experienced the variable conditions described the teacher as more unpredictable, original, flexible, and changeable than did those who were exposed to continuous reinforcement. However, the effect of the teacher's reinforcement schedule tended to be greater when he had not received instructions than when he had. Although these findings do not deal explicitly with perceived freedom, they are consistent with the contention that variable ratio reinforcement favors the attribution of freedom to the agent who dispenses it.

Insert Table 2 about here

Confidence in Ratings

As predicted by attribution theory, and in partial support of the second hypothesis, subjects indicated greater confidence in their evaluations of the teacher when he had received no instructions ($\bar{x}$=6.47) than when he had presumably been told how to administer reinforcements ($\bar{x}$=5.5, $p < .02$). Hypothesis 2 also predicted that subjects would be more confident of their evaluations of an agent employing a variable schedule of reinforcement than of one employing a continuous schedule. However, the means differed in the direction opposite to that specified by this prediction (CRF $\bar{x}$=6.30; VR $\bar{x}$=5.60; $p < .10$). Confidence was measured on a nine-step graphic scale.

Attentiveness

Attentiveness to cues concerning the teacher's beliefs and preferences was assessed by two measures of incidental learning: (a) number of teacher's associates correctly recalled, and (b) number of the teacher's responses to the teaching philosophy interview correctly recalled.

The maximum score for the association test was ten. Table 3 reports a main effect for reinforcement schedule ($p < .001$), indicating that the mean number of recalled responses was significantly higher for the variable ratio conditions (4.77) than for the continuous conditions (3.29). Neither the interaction effect nor the main effect of instructions was

significant.

Insert Table 3 about here

A Newman-Keuls test revealed that: (a) VR, no-instructions was significantly larger than CRF, no-instructions ($p < .01$), and (b) VR, instructions was significantly larger than CRF, instructions, ($p < .05$). The reinforcement schedule accounted for 12% of the variance in the number of associates recalled.

Six questions concerning the teacher's responses during the teaching philosophy interview were presented to the subject in the form of a multiple choice test. For each item there were three possible choices; thus the chance level of correct responding was represented by a score of 2. The results of the analysis of variance summarized in Table 4 revealed: (a) a significant main effect for reinforcement schedule ($p < .001$), indicating that the mean number of correct responses was significantly higher for the variable ratio conditions (3.71) than for the continuous conditions (2.53), and (b) a marginally significant main effect for instructions ($p < .06$), indicating that the number of correct responses for the without-instructions conditions (3.41) was higher than for the with-instructions conditions (2.82).

Insert Table 4 about here

A Newman-Keuls test revealed that: (a) VR, no-instructions

was significantly larger than CRF, no-instructions ($p < .01$), and (b) VR, instructions was significantly larger than CRF, instructions ($p < .05$). The schedule manipulation and the instructional manipulation accounted for 14% and 2% of the variance of the dependent variable.

These findings support Hypothesis 3 and are consistent with the contention that subjects are more attentive to cues emitted by agents reinforcing on a variable schedule than to agents reinforcing on a continuous schedule. There is also marginal support for the contention that subjects are more attentive to agents who have not publicly received reinforcement rules than to those who have been instructed to behave in a given manner.

Ingratiation

Each subject responded twice to the same 8-item version of the F scale, once at the outset of the experimental session and again after seeing the responses of the accomplice. In the second instance subjects knew their ratings would subsequently be viewed by the accomplice. To compute the conformity score the 5-inch graphic scales were divided into 20 quarter-inch segments. The subject's conformity score for each item was obtained by counting the number of segments he moved his second response in the direction of the accomplice's response.

A 2 x 2 analysis of variance performed on the conformity scores is summarized in Table 5. It reveals marginally significant main effects of the instructional manipulation ($p < .06$) and reinforcement schedule ($p < .10$). The differences between

the means reported in Table 5 are in the predicted directions, with more conformity being manifested by subjects receiving the variable ratio and no-instructions treatments. However, the variances within cells are sizable, and the obtained findings are interpreted as constituting weak but consistent support for hypothesis four. The instructional manipulation and the schedule manipulation account for 3.1% and 2% of the variance respectively.

Insert Table 5 about here

Attentiveness and Ingratiation as Correlates of Perceived Freedom

It was suggested above that (a) the degree of freedom attributed to a reinforcing agent depends upon the schedule of reinforcement he follows and upon whether or not he is believed to have been assigned a specific role; and that (b) attentiveness and ingratiation on the part of the reinforced individual are direct functions of the amount of freedom attributed to the agent. Data presented in Table 1 strongly supported the contention that perceived freedom is affected by the agent's reinforcing behaviors, but do not reveal a significant impact of reinforcement instructions. Table 6 reports correlations between perceived freedom and measures of attentiveness and ingratiation.

Insert Table 6 about here

For the entire sample of subjects each of the obtained correlations is positive and significant. For subjects receiving specific reinforcement treatments the correlations are, of course, attenuated by the narrow range of scores on perceived freedom. (Reinforcement schedule accounted for 48% of the variance of such scores.) However, even under these restrictive circumstances perceived freedom tends to be positively associated with attentiveness and ingratiation. The correlations for subjects receiving specific information treatments are also positive.

Discussion

It was predicted that a variable reinforcement schedule would evoke greater attentiveness to cues concerning the reinforcing agent's dispositional qualities, and more ingratiating behaviors, than would a continuous reinforcement schedule. These predictions were based on the assumption that an agent who employs a variable ratio is believed to possess a wide margin of freedom to do as he pleases. When an agent is perceived in this light, it behooves the recipient of his reinforcing actions to discover what pleases him and to act in a manner that will win his approval. The data of this study are consistent with these predictions and assumptions, though the relationship between the agent's reinforcement schedule and the amount of ingratiation he elicited did not reach a conventional level of statistical significance ($p < .10$).

Parallel predictions concerning the impact of publicly

assigning the agent reinforcement rules were not so uniformly supported. Subjects did not attribute significantly greater freedom to unassigned agents, and, although subjects manifested greater attentiveness when there was no public assignment, this effect was significant for only one of two measures. Unassigned subjects elicited more ingratiation than did those who were publicly assigned, but this outcome was only marginally significant ($p < .06$).

In retrospect it appears likely that our manipulation of role assignment was rather weak. The teacher was handed a small card and told that it carried instructions concerning proper reinforcing behavior. But the naive subject had no way of knowing how detailed these instructions might be, or whether they imposed severe or mild restrictions on the teacher's actions. Had this ambiguity not been present in the manipulation, findings concerning the effect of role assignment might have been more uniformly consistent with predictions. In any event, it should be noted that obtained results were in the anticipated directions even when they were not statistically significant.

It might be argued that the rather strong effect of reinforcement schedule reflected a difference between the treatments with respect to the amount of money subjects might conceivably expect to win. Thus, although subjects receiving VR and CRF treatments actually won the same amounts, it is reasonable to suspect that VR subjects envisioned the possibility of winning more than CRF subjects after the recess was

terminated. (In VR treatments the teacher dispensed and withdrew quarters, whereas in CRF treatments he dealt only with dimes.) If VR subjects believed the teacher had a larger sum at his disposal than did CRF subjects, the tendency of the former to manifest greater attentiveness and ingratiation may have reflected their estimates of the teacher's "stake" rather than his presumed freedom to dispense it. The data of this study do not permit an unequivocal test of this hypothesis, since the treatments that are likely to have encouraged the perception of high "stake" are the ones in which subjects attributed the most freedom to the teacher. However, the fact that perceived freedom tended to be positively correlated with attentiveness and ingratiation even within treatment categories suggests that the imagined magnitude of the teacher's "stake" was not totally responsible for the obtained results. Steiner (in press) has suggested that perceived freedom is a joint function of the valence of possible outcomes and the probability that they will be obtained. If this is the case, reinforcement schedule and "stake" may be co-determinants of the freedom that is attributed to a reinforcing agent.

It is possible that VR subjects are especially attentive because the agent's reinforcing behaviors seem unusual, illogical, or bizarre. Byrne and Clore (1967) have argued that inexplicable events threaten one's self confidence, and thus arouse an "effectance motive" (White, 1959). According to their view, one needs to understand the environment in order to feel secure, whereas the theory advanced in this paper maintains

that one seeks to understand manipulable aspects of the environment in order that they may be manipulated to one's advantage. Perhaps both motives for attentiveness are operative in many situations, but there is a reason for doubting that "effectance" is a very satisfactory explanation of the behaviors of our VR subjects. Byrne and Clore's scale for measuring effectance arousal was administered to all subjects immediately following completion of the anagrams task. The means of the obtained scores for the two reinforcement conditions were almost identical (VR=12.5; CRF=11.9; F < 1).

The findings of this study suggest that reinforcements have effects that are often ignored by researchers. When subjects are human beings, rewards and punishments may be more than mere instrumentalities for strengthening or weakening habits, or incentives by which desired behaviors are induced. They may also be communication devices which inform the recipient about the probable intentions, attitudes, and freedom of the agent who administers them. VR is likely to tell the recipient that he is dealing with a comparatively free agent whose actions reveal his personal preferences and idiosyncracies, and who may be susceptible to ingratiation. On the other hand, CRF tends to mark the agent as one who lacks freedom, whose behaviors disclose little about his dispositional character, and who is relatively immune to ingratiation. To be sure, when VR is administered by an experimenter in a laboratory setting, it may communicate approximately the same message as does CRF: human subjects are likely to realize that even seemingly

erratic experimenters are highly programmed and enjoy little discretionary freedom. However, outside the laboratory the pattern of reinforcements received by an individual may have a strong influence on the manner in which he perceives the controlling agent, and on his attitudes toward that person. If this is the case, behavior therapy may be assumed to evoke complex cognitive and evaluative processes which are not comfortably handled by the Skinnerian model. To a far greater degree than rats or even chimpanzees, humans appear to impose meaning upon social situations, and an agent's reinforcement schedule may readily become a source of cues which guide this endeavor.

It is easy to infer implications of this research for child training, teacher-pupil relations, and a broad array of situations in which reinforcements are employed. Additional work is needed to determine how completely the findings of this study can be generalized to cover events that occur in such real-life settings.

References

Berkowitz, L. Aggression: A social psychological analysis. New York: McGraw-Hill, 1962.

Burnstein, E., & Worchel, P. Arbitrariness of frustration and its consequences for aggression in a social situation. Journal of Personality, 1960, 30, 528-540.

Byrne, D., & Clore, G. Effectance arousal and attraction. Journal of Personality and Social Psychology Monograph, 1967, 6 (Whole No. 638).

Cohen, A. R. Social norms, arbitrariness of frustration, and status of the agent of frustration in the frustration-aggression hypothesis. Journal of Abnormal and Social Psychology, 1955, 51, 222-226.

Davidson, A. R. Reinforcement schedules and perceived freedom. Unpublished master's thesis, University of Illinois, 1970.

Hays, W. Statistics. New York: Holt, Rinehart and Winston, 1963.

Heider, F. The psychology of interpersonal relations. New York: Wiley, 1958.

Jones, E. E. Ingratiation. New York: Appleton-Century-Crofts, 1964.

Jones, E. E., & Davis, K. E. From acts to dispositions: The attribution process in person perception. In L. Berkowitz (Ed.), Advances in experimental social psychology, Vol. 2. New York: Academic Press, 1965, Pp. 219-226.

Jones, E. E., Davis, K. E., & Gergen, K. J. Role playing variations and their informational value for person perception. Journal of Abnormal and Social Psychology, 1961, 63, 302-310.

Jones, E. E., Gergen, L. J., Gumpert, P., & Thibaut, J. W. Some conditions affecting the use of ingratiation to influence performance evaluation. Journal of Personality and Social Psychology, 1965, 1, 613-625.

Jones, E. E., & Harris, V. A. The attribution of attitudes. Journal of Experimental and Social Psychology, 1967, 3, 1-24.

Kauffman, D. R., & Steiner, I. D. Some variables affecting the use of conformity as an ingratiation technique. Journal of Experimental Social Psychology, 1968, 4, 400-414.

Lanzetta, J. T., & Hannah, T. E. The reinforcing behaviors of "naive" trainers. Journal of Personality and Social Psychology, 1969, 11, 245-252.

Pastore, N. The role arbitrariness in the frustration-aggression hypothesis. Journal of Abnormal and Social Psychology, 1952, 47, 728-731.

Rotter, J. B. Generalized expectancies for internal versus external control of reinforcements. Psychological Monographs, 1966, 80. (Whole No. 609), Pp. 1-28.

Steiner, I. D. Perceived freedom. In L. Berkowitz (Ed.), Advances in experimental social psychology, Vol. 5. New York: Academic Press, in press.

Steiner, I. D., & Field, W. L. Role assignment and interpersonal influence. Journal of Abnormal and Social Psychology, 1960, 61, 239-246.

Thibaut, J. W., & Kelley, H. H. The social psychology of groups. New York: Wiley, 1959.

Waller, W. W., & Hill, R. The family: A dynamic interpretation. New York: Dryden Press, 1951.

Weiner, B., & Kukla, A. An attributional analysis of achievement motivation. Journal of Abnormal and Social Psychology, 1970, 15, 1-20.

White, R. W. Motivation reconsidered: The concept of competence. Psychological Review, 1959, 66, 297-333.

Winer, B. J. Statistical principles in experimental design. New York: McGraw-Hill, 1962.

Wiggins, J. A., Dill, F., & Schwartz, R. D. On "status liability". Sociometry, 1965, 28, 197-209.

Footnotes

1. This study was conducted as master's research by Davidson under the supervision of Steiner. It was supported by Grant M-4460 from the United States Public Health Service, National Institutes of Health.
2. Now at the University of Massachusetts. Requests for reprints should be addressed to Ivan D. Steiner, Department of Psychology, University of Massachusetts, Amherst, Massachusetts, 01002.
3. The VR schedule was identical for all subjects.
4. Four subjects were unable to solve one of the solvable anagrams: two in the VR, no-instructions condition, and one in each of the CRF conditions. Missing an anagram in a CRF condition resulted in the subject earning only $1.30, whereas it had no effect on earnings in the VR conditions. These four subjects were not dropped from the analysis; their scores on dependent variables were consistent with those of subjects responding correctly to all anagrams.
5. While the participants were completing the I-E scale the experimenter had placed checkmarks on an unmarked copy of the 8-item form he had collected from the subject. Two of the marks were located at exactly the same positions on the 5-inch graphic scales as were the subject's initial responses. Answers to three items were displaced 1½ inches in the direction of greater authoritarianism, and the other three were displaced one inch in the same direction. Direction of discrepancy was not varied because previous research (Kauffmann & Steiner, 1968) had shown that although direction

of discrepancy does indeed affect amount of ingratiation, there is no significant interaction of direction with a number of other variables.

Table 1

Analysis of Variance of the

Perceived Freedom Scores

Source	df	MS	F	p <
Between				
Instructions (I)	1	10.92	.73	.4
Schedule (S)	1	1,230.01	82.01	.001
I x S	1	19.10	1.27	.27
Within	84	14.99		

Group Means

		Reinforcement Schedule	
		VR	CRF
Instructions	Yes	11.64	5.09
	No	13.27	4.86

Table 2

Mean Ratings of the Reinforcing Agent

Made by Four Treatment Groups

Anchor Points 1 -> 9	VR, No-I	VR, I	CRF, No-I	CRF, I
Predictable -> Unpredictable	6.6	5.4	1.7	3.1
Programmed -> Original	6.2	3.6	3.3	3.5
Rigid -> Flexible	6.4	4.4	2.7	3.9
Consistent -> Changeable	6.3	5.0	1.8	3.2

Table 3

Analysis of Variance of the Number of Free Associates Recalled

Source	df	MS	F	p <
Between				
Instructions (I)	1	7.10	1.92	.17
Schedule (S)	1	48.10	12.99	.001
I x S	1	1.38	.37	.55
Within	84	3.70		

Group Means

		Reinforcement Schedule	
		VR	CRF
Instructions	Yes	4.36	3.14
	No	5.18	3.45

Table 4

Analysis of Variance of the Number of

Teaching Philosophy Responses Correctly Identified

Source	df	MS	F	p <
Between				
Instructions (I)	1	7.68	3.85	.054
Schedule (S)	1	30.73	15.39	.001
I x S	1	.73	.36	.55
Within	84	2.00		

Group Means

		Reinforcement Schedule	
		VR	CRF
Instructions	Yes	3.32	2.32
	No	4.09	2.73

Table 5

Analysis of Variance of the Conformity Scores

Source	df	MS	F	p <
Between				
Instructions (I)	1	180.41	3.88	.052
Schedule (S)	1	127.68	2.76	.10
I x S	1	11.64	.25	
Within	84	46.40		

Mean Conformity and Standard Deviation Per Cell

	VR, No-I	VR, I	CRF, No-I	CRF, I
$\bar{x}$	10.55	8.41	8.86	5.27
S.D.	6.59	6.43	7.43	6.76

Table 6

Correlation Between Attributed Freedom and Other Variables

Category of Subjects:	N	Variables: Attentiveness to Teaching Associates	Philosophy	Conformity
All Subjects	88	.38***	.38***	.21**
VR Subjects	44	.26**	.09	.35***
CRF Subjects	44	.11	.23*	-.07
Instructions Subjects	44	.34***	.34***	.14
No-Instructions Subjects	44	.40***	.41***	.25**

* Significantly different from zero at the .1 level
** Significantly different from zero at the .05 level
*** Significantly different from zero at the .01 level